IN THE CLAIMS

Please cancel Claims 19 and 20, enter indicated Amendments and Allow Claims 1-18.

1. (presently amended): A system for aligning a sample comprising:

a pivot mounted stage/sample which is rotatable about "X", "Y" and optionally "Z" axes;
a means for imparting translation motion to said pivot mounted stage/sample substantially along a perpendicular to a surface thereof in a "Z" direction;
a first source of a first beam of electromagnetic radiation in functional combination with
a multi-element alignment detector comprised of at least two detector elements closely surrounding a hole therethrough; and
a second source of a second beam of electromagnetic radiation comprising a polarization state generator; and
a data detector comprising a polarization state detector;

said first source of a first beam of electromagnetic radiation being oriented so as to provide a first beam of electromagnetic radiation through said hole in said multi-element alignment detector;

said pivot mounted stage/sample being positioned to receive said first beam of electromagnetic radiation substantially along a normal to a surface of said pivot mounted stage/sample via said hole in said multi-element alignment detector;

said second source of electromagnetic radiation being positioned

to provide a second beam of electromagnetic radiation and direct it to the surface of said sample at an oblique angle thereto, such that said second beam of electromagnetic radiation reflects from said surface of said pivot mounted stage/sample;

said first and second electromagnetic beams being oriented with respect to one another at a known angle;

said pivot mounted stage/sample being mounted to said means for imparting translation motion such that said pivot mounted stage/sample can be caused to move substantially along a perpendicular to the surface thereof in the "Z" direction, such that the reflected second beam of electromagnetic radiation enters said data detector.

2. (presently amended): A method of aligning a sample comprising the steps of:

a) providing a pivot mounted stage/sample which is rotatable about "X", "Y" and optionally "Z" axes; and
a means for imparting translation motion to said pivot mounted stage/sample substantially along a perpendicular to a surface thereof in the "Z" direction;
a first source of a first beam of electromagnetic radiation in functional combination with a multi-element alignment Detector comprised of at least two detector elements <u>closely</u> surrounding a hole therethrough; and
a second source of a second beam of electromagnetic radiation <u>comprising a polarization state generator</u>; and
a data detector <u>comprising a polarization state detector</u>;

said first source of a first beam of electromagnetic radiation being oriented so as to provide a first beam of electromagnetic

radiation through a hole in said multi-element alignment detector;

said pivot mounted stage/sample being positioned to receive said first beam of electromagnetic radiation substantially along a normal to a surface of said pivot mounted stage/sample via said hole in said multi-element alignment detector;

said second source of a second beam of electromagnetic radiation being oriented such that a beam of electromagnetic is provided thereby at an oblique angle to the surface of said sample;

said first and second electromagnetic beams being oriented with respect to one another at a known angle;

b) causing a first beam of electromagnetic radiation from said first source of a first beam of electromagnetic to pass through said hole in the multi-element alignment detector such that said first beam of electromagnetic radiation reflects from the surface of said pivot mounted stage/sample;

c) pivoting said sample about said stage/sample pivot mounting about at least one of the "X" and "Y" axes until signals from all of the detector detector elements in the multi-element alignment detector are substantially minimized or equalized, indicating that said first beam of electromagnetic radiation approaches said surface of said sample substantially along a normal thereto;

d) causing said second source of electromagnetic radiation to provide a second beam of electromagnetic radiation and direct it to the surface of said sample at an oblique angle thereto, such that said second beam of electromagnetic radiation reflects from said surface of said pivot mounted stage/sample;

e) optionally causing said pivot mounted stage/sample to undergo translation motion substantially perpendicular to the surface of said sample in the "Z" direction via said means for imparting translation motion to said pivot mounted stage/sample in the "Z" direction;

such that the reflected second beam of electromagnetic radiation is directed to enter said data detector.

3. (original): A method of aligning a sample as in Claim 2, wherein the steps c. and e. are automated.

4. (original): A method of aligning a sample as in Claim 2, which comprises repeating the method at another location on the sample.

5. (original): A method of aligning a sample as in Claim 2, wherein the multi-element alignment detector is a quad detector comprising four detector elements.

6. (presently amended): A system for aligning a sample comprising:

a pivot mounted stage/sample which is rotatable about "X", "Y" and optionally "Z" axes;

a means for imparting translation motion to said pivot mounted stage/sample substantially along a perpendicular to a surface thereof in the "Z" direction;

a first source of a first beam of electromagnetic radiation in functional combination with a beam splitter and a multi-element alignment detector comprised of at least two detector elements; and

a second source of a second beam of electromagnetic radiation comprising a polarization state generator; and

a data detector comprising a polarization state detector;

said first source of a first beam of electromagnetic radiation being oriented so as to transmit a first beam of electromagnetic radiation through said beam splitter;

said pivot mounted stage/sample being positioned to receive said first beam of electromagnetic radiation substantially along a normal to a surface of said pivot mounted stage/sample via said beam splitter;

said multi-element alignment detector being positioned to receive electromagnetic radiation reflected from said surface of said sample which is reflected from said beam splitter;

said second source of electromagnetic radiation being positioned to provide a second beam of electromagnetic radiation and direct it to the surface of said sample at an oblique angle thereto, such that said second beam of electromagnetic radiation reflects from said surface of said pivot mounted stage/sample;

said first and second electromagnetic beams being oriented with respect to one another at a known angle;

said pivot mounted stage/sample being mounted to said means for imparting translation motion such that said pivot mounted stage/sample can be caused to move substantially along a perpendicular to the surface thereof in the "Z" direction, such that the reflected second beam of electromagnetic radiation enters said data detector.

7. (presently amended): A method of aligning a sample comprising

the steps of:

a) providing a system for aligning a sample comprising:

a pivot mounted stage/sample which is rotatable about "X", "Y" and optionally "Z" axes;
a means for imparting translation motion to said pivot mounted stage/sample substantially along a perpendicular to a surface thereof in the "Z" direction;
a first source of a first beam of electromagnetic radiation in functional combination with a beam splitter and a multi-element alignment detector comprised of at least two detector elements; and
a second source of a second beam of electromagnetic radiation comprising a polarization state generator; and
a data detector comprising a polarization state detector;

said first source of a first beam of electromagnetic radiation being oriented so as to transmit a first beam of electromagnetic radiation through said beam splitter;

said pivot mounted stage/sample being positioned to receive said first beam of electromagnetic radiation substantially along a normal to a surface of said pivot mounted stage/sample via said beam splitter;

said multi-element alignment detector being positioned to receive electromagnetic radiation reflected from said surface of said sample which is reflected from said beam splitter;

said second source of electromagnetic radiation being positioned to provide a second beam of electromagnetic radiation and direct it to the surface of said sample at an oblique angle thereto,

such that said second beam of electromagnetic radiation reflects from said surface of said pivot mounted stage/sample;

said first and second electromagnetic beams being oriented with respect to one another at a known angle;

said pivot mounted stage/sample being mounted to said means for imparting translation motion such that said pivot mounted stage/sample can be caused to move substantially along a perpendicular to the surface thereof, such that the reflected second beam of electromagnetic radiation enters said data detector;

b) causing a first beam of electromagnetic radiation from said first source of a first beam of electromagnetic to pass through said beam splitter such that said first beam of electromagnetic radiation reflects from the surface of said pivot mounted stage/sample, then reflects from said beam splitter and enters said multi-element alignment detector;

c) pivoting said sample about said stage/sample pivot mounting about at least one of the "X" and "Y" axes until signals from all of the multi-element alignment detector detector elements are substantially minimized or equalized, indicating that said first beam of electromagnetic radiation approaches said surface of said sample substantially along a normal thereto;

d) causing said second source of electromagnetic radiation to provide a second beam of electromagnetic radiation and direct it to the surface of said sample at an oblique angle thereto, such that said second beam of electromagnetic radiation reflects from said surface of said pivot mounted stage/sample;

e) optionally causing said pivot mounted stage/sample to

undergo translation motion substantially perpendicular to the surface of said sample in the "Z" direction via said means for imparting translation motion to said pivot mounted stage/sample;

such that the reflected second beam of electromagnetic radiation is directed to enter said data detector.

8. (original): A method of aligning a sample as in Claim 7, wherein the steps c. and e. are automated.

9. (original): A method of aligning a sample as in Claim 7, which comprises repeating the method at another location on the sample.

10. (original): A method of aligning a sample as in Claim 7, wherein the multi-element alignment detector is a quad detector comprising four detector elements.

11. (original): A system as in Claim 1 in which the multi-element alignment detector is a quad detector comprising four detector elements.

12. (original): A system as in Claim 6 in which the multi-element alignment detector is a quad detector comprising four detector elements.

13. (original): A method of aligning a sample as in Claim 2 in which the first and beams of electromagnetic radiation from the first and second sources of electromagnetic radiation to both impinge on the sample surface at substantially the same spot.

14. (original): A method of aligning a sample as in Claim 3 in which the first and beams of electromagnetic radiation from the first and second sources of electromagnetic radiation to both

impinge on the sample surface at substantially the same spot.

15. (original): A method of aligning a sample as in Claim 7 in which the first and beams of electromagnetic radiation from the first and second sources of electromagnetic radiation both impinge on the sample surface at substantially the same spot.

16. (original): A method of aligning a sample as in Claim 2 in which the first and beams of electromagnetic radiation from the first and second sources of electromagnetic radiation impinge on the sample surface at different locations.

17. (original): A method of aligning a sample as in Claim 3 in which the first and beams of electromagnetic radiation from the first and second sources of electromagnetic radiation impinge on the sample surface at different locations.

18. (original): A method of aligning a sample as in Claim 7 in which the first and beams of electromagnetic radiation from the first and second sources of electromagnetic radiation impinge on the sample surface at different locations.

19. (canceled):

20. (canceled):